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REMARKS

Claims 3-5, 8-16, and 23-27 are all the claims presently pending in the application.

Applicant acknowledges and appreciates that claims 11-16 and 23-27 are allowed.

For the reasons set forth below, however, Applicant respectfully submits that all of the pending claims are allowable over the prior art of record.

Claims 3 and 8 stand rejected under 35 U.S.C. 102(e) as being anticipated by Gelman et al. (US 6,493,348) (hereinafter Gelman). Claims 5 and 10 stand rejected under 35 U.S.C. 102(e) as being anticipated by Johnson (US 6,765,910). Claims 4 and 9 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Gelman in view of Johnson.

These rejections are respectfully traversed.

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I. THE CLAIMED INVENTION

Claim 3 recites a demultiplexing method of receiving a multiplexed signal. The multiplexed signal is obtained by multiplexing a plurality of communication signals from a multiplexed signal transmitting section, demultiplexing the multiplexed signal into communication signals, and transmitting the demultiplexed communication signals to a communication signal receiving section. The method of receiving a multiplexed signal includes adding an identification address to each of the plurality of communication signals. The identification address is preassigned to a predetermined signal identifying section, through which a communication signal passes in a multiplexing system including the multiplexed signal transmitting section and the communication signal receiving section. The method of receiving a multiplexed signal also includes outputting each of the communication signals, extracting the identification address from each of the output signals, and demultiplexing the multiplexed signal for each of the communication signals on the basis of the extracted identification address.

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Claim 5 recites a demultiplexing method of demultiplexing a multiplexed signal obtained by multiplexing a plurality of packets into packets. The method includes extracting an IP address from each packet in the received multiplexed signal for each of the plurality of packets, the IP being preassigned to a predetermined signal identifying section through which a communication signal passes, and demultiplexing the multiplexed signal into PPP packets on the basis of the extracted IP addresses.

Claim 8 recites a demultiplexing apparatus which is connected to a multiplexed signal transmitting section through a multiplex communication path. The demultiplexing apparatus demultiplexes a multiplexed signal received from the multiplex communication path, and transmits demultiplexed communication signals to a communication signal receiving section through communication paths for the respective communication signals. The demultiplexing apparatus includes address extracting means, connected to the multiplex communication path, for extracting an identification address added to each of the communication signals in the multiplexed signal received from the multiplex communication path. The identification addresses added are preassigned to a predetermined signal identifying section, through which a communication signal passes in a demultiplexing section including said multiplexed signal transmitting section and said communication signal receiving section. The demultiplexing apparatus also includes demultiplexing means for demultiplexing the multiplexed signal into the respective communication signals on the basis of the identification addresses of the respective communication signals which are extracted by the address extracting means.

Claim 10 recites a demultiplexing apparatus which is connected to a multiplex communication path through which a multiplexed signal, obtained by multiplexing packets addressed to subscriber apparatuses, is transmitted. The demultiplexing apparatus demultiplexes the multiplexed signal received from the multiplex communication path, and

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outputs each demultiplexed communication signal. The demultiplexing apparatus includes address extracting means, connected to the multiplex communication path, for extracting an IP address of each packet in the multiplexed signal received from the multiplex communication path, the IP address being preassigned to a predetermined signal section of the multiplexed signal and demultiplexing means for demultiplexing the multiplexed signal into the respective packets on the basis of the IP addresses of the respective packets extracted by the address extracting means.

Conventionally, in the Internet, prior to data communication upon forming a communication path between two terminals connected to the Internet, the terminals must be connected to a backbone network through an access network. For this connection, the Point-to-Point Protocol (PPP) is used.

In the conventional networks, an apparatus which discriminates each subscriber who tries to access the Internet and has a function for Asynchronous Transfer Mode (ATM) processing must be installed at an entrance to the backbone network. Such an apparatus must be added every time the number of subscribers increases. In addition, the PPP termination apparatus is often installed near the backbone network to which packets from many subscribers are sent upon multiplexing.

As the number of subscribers who access the Internet increases, an apparatus for performing Point-to-Point Protocol (PPP) processing as processing indispensable to connection of the subscribers to the backbone network of the Internet must be added. Such an apparatus may be installed in a place as near to the subscribers as possible, i.e., in an apparatus for providing Internet services. In this case, it is required to avoid complication of PPP, complication of its system, complication of a management system for the system, and the like. See the Application, Page 6, Line 7 to Page 7, Line 4.

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The present invention, however, provides, "an identification address, for each of the communication signals, which is added to each of the communication signals in the multiplexed signal received from the multiplex communication path and preassigned to a predetermined signal identifying section through which a communication signal passes in a demultiplexing section including said multiplexed signal transmitting section and said communication signal receiving section," as recited in claim 1. These features provide a simpler arrangement for PPP processing.

The present invention, therefore, provides a multiplexing method and apparatus, demultiplexing method and apparatus, access network system, subscriber multiplexing/demultiplexing apparatus, and protocol termination apparatus which can multiplex PPP packets on the basis of media access control (MAC) addresses and the like, demultiplex the packets on the basis of MAC or IP addresses, and simplify an arrangement for PPP processing by using these multiplexing and demultiplexing processes. See the Application, Page 7, Line 17 to Page 8, Line 5.

II. THE PRIOR ART REJECTIONS

a. Gelman

On page 2 of the Office Action, the Examiner rejects claims 3 and 8 under 35 U.S.C. 102(e) as being anticipated by Gelman. Applicant submits, however, that there are elements of the claimed invention which are not taught by Gelman

To anticipate a claim, a reference must teach every element of the claim. "A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). "The identical invention must be shown in as complete detail as is contained in the ... claim." *Richardson v.*

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Suzuki Motor Co., 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989). The elements must be arranged as required by the claim, but this is not an *ipsissimis verbis* test, i.e., identity of terminology is not required. *In re Bond*, 910 F.2d 831, 15 USPQ2d 1566 (Fed. Cir. 1990).

Gelman is directed to a network in which all the nodes therein communicate via the same protocol, each node having an IP address. Information is transmitted conventionally, via a packet with an address header and a payload. However, Gelman does not disclose or suggest "demultiplexing the multiplexed signal for each of the communication signals on the basis of the extracted identification address," as recited in claim 3. That is, Gelman discloses only a conventional internetwork communication arrangement and does not even disclose overcoming the conventional difficulties of providing a PPP performing apparatus near the Internet subscriber.

On page 5 of the Office Action, the Examiner maintains his rejection based on an allegation that "routing tables are commonly used for the transmission of packets through nodes. These routing tables contain preassigned addresses." Contrary to the Examiner's understand, claims 3 and 8 are directed to demultiplexing inbound multiplexed signals by "extracting" the identification address provided therein. Routing tables, on the other hand, do not disclose or suggest "adding, to each of the plurality of communication signals, an identification address preassigned to a predetermined signal identifying section through which a communication signal passes in a multiplexing system including the multiplexed signal transmitting section and the communication signal receiving section," as recited in independent claim 3, and similarly recited in independent claim 8 because the routing tables are IP packets communicated throughout a local network and not a communication of multiplex signals each internally assigned an address.

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Instead, Gelman discloses protocol stack 30 and 32, and, in particular, an operation of web server 28a (see Col. 4, Lines 18-39) where a route between web server 28a and terminal 15 is disclosed.

The only disclosure provided with respect to FIG. 2 is that the IP edge routers provide a routing mechanism and "provide the Ethernet bridging capability in order to be able to address the user's LAN." (See Gelman, Col. 4, Lines 40-46) Further, an address resolution protocol broadcasts the address to be resolved on the LANs, resulting in increased traffic. (see Col. 4, Lines 60-65) Therefore, instead of disclosing a preassigned address, as the Examiner alleged, Gelman requires the router to broadcast and then resolve the relevant addresses.

Accordingly, the Examiner has improperly interpreted Gelman to disclose or suggest "adding, to each of the plurality of communication signals, an identification address preassigned to a predetermined signal identifying section through which a communication signal passes in a multiplexing system including the multiplexed signal transmitting section and the communication signal receiving section," as recited in independent claim 3, and similarly recited in independent claim 8.

Therefore, because Gelman does not disclose or suggest every feature recited in independent claims 3 and 8, these claims are improperly rejected in light of Gelman. Accordingly, Applicant submits that claims 3 and 8 are in condition for allowance. With respect to claims 4 and 9, which depend from independent claims 3 and 8 respectively, each of these claims contain all the limitations contained within claims 3 and 8 and are therefore also in condition for allowance.

Therefore, Applicant respectfully requests the Examiner to reconsider and withdraw this rejection.

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b. Johnson

On page 3 of the Office Action, the Examiner alleges that Johnson discloses the claimed invention of claims 5 and 10. Applicant submits, however, there are features recited in the rejected claims that are neither disclosed nor suggested by Johnson.

Johnson is directed to a multiplex communication system to communicate with customers. In particular, the Examiner alleges that discloses all the elements recited in claims 5 and 10. The Examiner cites Col. 8, Lines 22-40 as evidence for these allegations. Johnson, however, discloses that switch router 30 separates packets out of a PPP stream when it detects packets that are intended for the server. That is, the portion cited by the Examiner discloses a version of the conventional communication system where a router is required to search each packet to determine if the packet is intended for the server of customer.

That is, Johnson discloses that, from a PPP stream, router 30 dissects packets from the stream. In addition, packets directed to subscriber devices 12 are likewise diverted. That is, contrary to the Examiner's allegation, Johnson provides no teaching of "extracting an IP address from each packet in the received multiplexed signal for each of the plurality of packets, the IP address being preassigned to a predetermined signal identifying section through which a communication signal passes," as recited in claim 5 because the PPP addresses because "these routing decisions are made using addressing information (e.g., IP addresses) embedded in the packet headers." See Johnson, Col. 8, Lines 37 to 40.

Accordingly, Johnson does not teach the claimed invention that simplifies an arrangement for PPP processing by using these multiplexing and demultiplexing processes. Instead, Johnson still teaches that "each resident may be provided a single (physical) network connection configured as a PPP link." See Johnson, Col. 8, Lines 57 to 65. That is, Johnson presents the conventional, complex PPP assignment that the claimed invention overcomes.

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Therefore, contrary to the assertions of the Examiner, Johnson does not teach or suggest, "for each of the plurality of packets, the IP address being preassigned to a predetermined signal identifying section through which a communication signal passes," as recited in independent claim 5, and similarly recited in independent claim 10.

Therefore, because Johnson does not disclose or suggest every feature recited in independent claims 5 and 10, these claims are improperly rejected in light of Johnson. Accordingly, Applicant submits that claims 5 and 10 are in condition for allowance.

Therefore, Applicant respectfully requests the Examiner to reconsider and withdraw this rejection

c. Gelman in view of Johnson.

On page 4 of the Office Action, the Examiner rejects dependent claims 4 and 9 under 35 U.S.C. § 103(a) over Gelman in view in Johnson.

To establish a prima facie case of obviousness, several basic criteria must be met. For example, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art and not based on applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). See MPEP 706.02(j). In addition, as stated in *KSR*, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness (*In re Kahn*, 441 F.3d 977, 988 (CA Fed. 2006) cited with approval in *KSR Int'l. v. Teleflex, Inc.*, 127 S.Ct. 1727 (2007)).

However, as discussed above, dependent claims 4 and 9 depend from independent claims 3 and 8, respectively. Accordingly, dependent claims 4 and 9 contain every limitation contained within claims 3 and 8. As discussed above, Gelman fails to disclose or suggest

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every element recited within claims 3 and 8. Furthermore, pursuant to the discussion regarding claims 5 and 10, Johnson fails to make up for Gelman's deficiencies.

Nonetheless, Johnson discloses at Col. 8, Lines 22-37:

"In one embodiment, the switch/router 30 provides a switching bridge through which PPP streams may pass on their path from subscriber devices 12 (such as personal computers) to an external ISP. Switch/router 30 is also coupled to one or more servers 24. Switch/router 30 examines the contents of the PPP stream, selectively separates certain packets out of the PPP stream when it detects packets that are intended for a server 24, and forwards them only to the intended server 24. Similarly, packets arriving at switch/router 30 from a server 24 are formatted into the PPP format and gracefully inserted into the PPP stream sent back to the subscriber device 12. This is preferably done such that communications to and from the ISP are maintained for the packets exchanged between subscriber device 12 and Internet destinations reached through the ISP."

That is, Johnson discloses that, from a PPP stream, router 30 dissects packets from the stream. In addition, packets directed to subscriber devices 12 are likewise diverted. That is, contrary to the Examiner's allegation, Johnson provides no teaching that "the communication signal includes a PPP packet created for each Internet subscriber apparatus, and the identification address includes a MAC address," as recited in claim 4 because the PPP addresses because "these routing decisions are made using addressing information (e.g., IP addresses) embedded in the packet headers." See Johnson, Col. 8, Lines 37 to 40. Furthermore, Johnson provides no teaching whatsoever of including a MAC address, as recited in claim 4.

Accordingly, neither Gelman nor Johnson teaches the claimed invention that simplifies an arrangement for PPP processing by using these multiplexing and demultiplexing processes. Instead, Johnson still teaches that "each resident may be provided a single (physical) network connection configured as a PPP link." See Johnson, Col. 8, Lines 57 to 65. That is, Johnson presents the conventional, complex PPP assignment that the claimed invention overcomes.

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Therefore, because neither Gelman nor Johnson teach or suggest every feature recited in dependent claims 4 and 9, these claims are improperly rejected in light of Gelman and Johnson. Accordingly, Applicant submits that dependent claims 4 and 9 are in condition for allowance.

Therefore, Applicant respectfully requests the Examiner to reconsider and withdraw this rejection

III. CONCLUSION

In view of the foregoing, Applicant submits that claims 3-5, 8-16, and 23-27, all the claims presently pending in the application, are patentably distinct over the prior art of record and are in condition for allowance. The Examiner is respectfully requested to pass the above application to issue at the earliest possible time.

Should the Examiner find the application to be other than in condition for allowance, the Examiner is requested to contact the undersigned at the local telephone number listed below to discuss any other changes deemed necessary in a telephonic or personal interview.

The Commissioner is hereby authorized to charge any deficiency in fees or to credit any overpayment in fees to Attorney's Deposit Account No. ~~50-0461~~.

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